Issue Number 5 — September 1983

STOP PRESS DRAGON

DRAGON RELEASES DISKS

Dragon Data Ltd has launched a Disk Drive unit for the Dragon 32 home computer.
The Disk Drive will expand the power of your 32, speed up program loading and data file handling. It is the next step up in data and program storage from the cassette recorder and can itself be expanded as you and your Dragon system progress.
Priced at £275, the Dragon Disk Drive is a single half height drive in a coated steel case. It has an internal power supply and is easily expandable to a double disk system by inserting an additional drive. Two double units can be linked to form a 4-drive system.

Its specifications are:
Disk Type
5¼" Mini diskette
Memory Capacity
(Formated) 184320 bytes
Disk Organisation
Single sided
Double density
40 tracks (TPI)
18 sectors per track
256 bytes per sector
Directory on track 20
Case
Coated steel, capable of holding two half height drives
Weight (with one drive)
4.4Kg
The controller can support up to four drives, single or double sided capability. Up to ten files may be open simultaneously. The disk operating system is held in ROM (Read memory only) on the controller card.
The Dragon Disk Drives will be available through the usual Dragon dealerships and retailers, including Boots and Dixons.

EDITORIAL

Stop Press Number 4 is here! Despite the attraction of the sun-kissed beaches of South-Wales at the time of compilation, our latest edition comes packed with programs and articles ready for the onset of darker nights and longer Dragon sessions.
Many young readers will be starting computer studies in their new school year. With a Dragon at home they will have a great opportunity to continue their classroom experiences at leisure. Why not teach Mum and Dad to program? After all there's nothing like teaching for helping you to learn!
Stop Press, after four issues, has certainly developed a character of its own, quite different from other computing periodicals. We have been encouraged by your letters to believe that its main theme of providing programming material in a helpful way is the right one and long may this continue.
Inside this issue there is the usual Machine Code Corner which carries on from the last issue to look at some of the techniques involved with moving graphics. The Young Users Page concentrates on LOOPS and CIRCLES.
Our first competition (Draw a Dragon Logo) produced a good crop of responses from our younger programmers including entries from abroad. Congratulations to you all for some professional programs. This issue's competition is extended to all ages, or even to family entries. So get your heads together and send us your programs, on cassette please, to the editorial address:-

Miss Cathy Hyde
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Kenfig Industrial Estate
Margam
Port Talbot
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The editors have had the privilege of using Dragon Data's new disc system prior to its general release and have been thrilled with its impact on the use of Dragon whether it be in writing programs (the disc-system has an automatic line-numbering feature which is a boon!) or word-processing Stop Press or whatever. We are sure that the introduction of this system will offer many exciting possibilities to Dragon owners for use in their work and we hope to explore this aspect in future editions. Nevertheless we must remember that the reliable and fast cassette interface on Dragon has always been one of its many strong points and we are constantly impressed by Dragon's ability to create and maintain program or data files on tape. (See the letters page for an example of a data file.)
Dragon owners with young children (eight years upwards?) may wish to find a suitable book to introduce them to the art of Dragon Programming. Foulsham have now published 'Dragon Magic' (mentioned in a previous Stop Press). Its large size print and amusing cartoons make it an ideal book for the young beginner. Once again the editors invite you to write to us with your hints and suggestions for future articles and programs of interest to other readers.

MACHINE CODE CORNER

In the last edition of Stop Press, we explored a few simple methods of moving shapes around the high-resolution graphics screen. Our main concern was vertical movement, since that could be achieved by copying values from byte to byte, without getting involved at the "bit" level. The time has come to grasp the nettle - and look at horizontal movement.

But first we need to learn about a very special register - the Condition Code Register (CC). This is a 1-byte (8 bit) register, in which each separate bit has a job to do in describing the operation state of the computer. Each bit is either Ø (clear) or 1 (set). The eight bits of the CC register are as follows:

E	F	H	I	N	Z	V	C

E-Entire State Flag
F-Fast Interrupt Request Mask
H-Half Carry Flag
I-Interrupt Request Mask
N-Sign Flag
Z-Zero Flag
V-Overflow Flag
C-Carry Flag

When various machine code commands are executed, these flags are frequently cleared or set according to the result of the command. In fact, we have often used the zero flag (Z), without referring to it by name. One effect of the **CMP** command is to set Z if (and only if) the result is "true". For example, **CMPY #$60F** will set Z if Y is equal to **$60F**. The **BNE** command makes use of this, by causing a branch if Z is clear. So if Z is set by the **CMP** command, there will be no branch.

Two commands which give the programmer direct access to CC are ANDCC (opcode 1C) and ORCC (opcode 1A). These perform respectively a logical "AND" and a logical "inclusive OR" between CC and the number in the operand.

For example, to set Z, we need to perform an inclusive OR with binary ØØØØØ1ØØ, i.e. with #4. This is because an inclusive OR with a Ø results in "no change" (to all except Z) and an inclusive OR with 1 for Z results in 1 whether or not Z was previously set. As a result. **ORCC #4** sets Z. Similarly, to clear Z, we need an AND with binary 11111Ø11, i.e. with #251. This is because an AND with 1 results in "no change" whereas an AND with Ø results in Ø. So **ANDCC #251** clears Z.

Now, let's get back to horizontal movement. You will recall that in **PMODE4** each pixel of the high-resolution screen is represented by one bit, which is either 'on' (green or buff) or 'off' (black). Eight of these bits are combined in one byte of memory. The diagram below shows how a black segment of 3 pixels wide is moved to the right a pixel at a time.

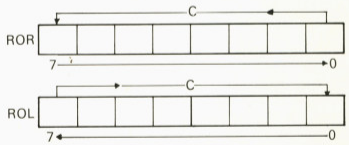
byte 1	byte 2
76543210	76543210
1. 11100011	11111111
2. 11110001	11111111
3. 11111000	11111111
4. 11111100	01111111
5. 11111110	00111111
6. 11111111	00011111
7. 11111111	10001111

Two bytes are illustrated, and the bits are labelled from 7 down to Ø, which is the usual convention. We can break down the various operations as follows:
(a) a fresh '1' comes in from the left of byte 1;
(b) the bits of byte 1 are shifted to the right;
(c) bit Ø of byte 1 moves to bit 7 of byte 2;
(d) the bits of byte 2 are shifted to the right.

If the diagram is read in reverse order (bottom to top) the problem of horizontal movement to the left is seen to be very similar.

Two commands which go a long way towards solving the problem are ROR (Rotate Right) and ROL (Rotate Left). These commands rotate the bits *THROUGH THE CARRY FLAG*. In other words, ROR has the effect of (a) transferring whatever is in the carry flag to bit 7, (b) rotating bits 7-6-5-4-3-2-1 to 6-5-4-3-2-1-Ø, (c) loading bit Ø into the carry flag. ROL has the reverse effect.

A diagram may help.



So the operation of movement to the right may be achieved by setting the carry flag, ROR the first byte, ROR the second byte. The carry-over between bytes is taken care of automatically by the carry flag.

We shall now use ROR to fire an arrow across the screen. First in Basic:

```
10 PMODE4,1:PCLS1:COLOR0,1:SCREEN1,0
20 DIMA(2)
30 DRAW"BM1,50RDR2D2LGLE2R12NH2G2"
40 GET(0,50)-(15,54),A
50 X$=INKEY$:IFX$=""THEN50
60 FORI=1TO240:PUT(I,50)-(I+15,54),A,PSET:NEXT
70 GOTO70
```

Note that the DIM statement is necessary for GET/PUT, even though it is not usual to dimension a variable less than 11. The arrow is released by pressing any key. Obviously, machine code is called for (which refreshes the parts other languages can't reach). First we must calculate the address of the bytes making up the arrow. Normally, the graphics screen will start at hex 6Ø0, but we shall make the program a little more general (to allow for those who may wish to use PMODE4,2 or those who have a Dragon Disk System in operation). The address of the top left hand corner of the current grapics screen is contained in memories BA/BB. To this value we must add 50x32 = 160Ø since the arrow starts on row 5Ø, and each row is 32 bytes. The following program does the job.

```
                                          Machine code
 1              LDY     $BA              10 9E BA
 2              LEAY    1600,Y           31 A9 06 40
 3              LDA     #30              86 1E
 4              STA     $7FFF            B7
                                         7FFF
 5   LOOP1      LDA     #8               86 08
 6   LOOP 2     LEAX    ,Y               30 A4
 7              LDB     #$15             C6 15
 8   LOOP3      ORCC    #1               1A 01
 9              ROR     ,X               66 84
10              ROR     1,X              66 01
11              ROR     2,X              66 02
12              LEAX    32,X             30 88 20
13              DECB                     5A
14              BNE     LOOP3            26 F2
15              DECA                     4A
16              BNE     LOOP2            26 EB
17              LEAY    1,Y              31 21
18              DEC     $7FFF            7A 7F FF
19              BNE     LOOP1            26 E2
20              RTS                      39
```

Lines 1 and 2 give Y the address of the top-left byte of the arrow. Lines 3 and 4 store 3Ø in **$7FFF** (to keep a check on the number of times Y is incremented in line 17). A and B are used for counting - they are decremented until they reach zero. Line 8 sets the carry flag, so that the first ROR uses a 1. Note that after a DEC command the zero flag (Z) is set if the result is Ø. This is then checked by the BNE command.

The code may be POKEd in using

```
10 DATA 10,9E,BA,31,A9,06,40,86,1E,B7,7F,FF,86,08
20 DATA 30,A4,C6,15,1A,01,66,84,66,01,66,02,30,88,20
25 DATA 5A,26,F2,4A,26,EB,31,21,7A,7F,FF,26,E2,39
30 FORI=0TO42:READX$:POKEI+32000,VAL("&H"+X$):NEXT
```

The required Basic program is then

```
10 PMODE4,1:PCLS1:COLOR0,1:SCREEN1,0
20 DRAW"BM1,50RDR2D2LGLE2R12NH2G2"
30 X$=INKEY$:IFX$=""THEN30
40 EXEC32000
50 GOTO50
```

A much more realistic arrow!

ISLANDS

Can you steer your craft through the islands to the red jetty on the right of the screen? Unfortunately it is rather foggy so you have only occasional glimpses of the islands. The higher your score the rarer the glimpses! If your craft touches the bottom of the shallow water round an island it sticks there a moment before you can release it. If you really run aground you must start back at the beginning. Aim for the fastest time. You steer your craft with the arrow keys and stop it dead with the spacebar.

```
500 FOR I=0 TO 1:JJ=JOYSTK(I)-32:IF ABS(JJ)<20 THEN 550
```

Now insert NEXT into line 55Ø making it:-

```
550 NEXT:X=D(0):Y=D(1)*3/4: RETURN
```

Bon voyage.

```
 1 REM ISLANDS. MAVIS PEARSON. KEYBOARD VERSION.
10 PCLEAR4:L=2:S$=CHR$(8)+CHR$(9)+CHR$(94)
   +CHR$(10)+CHR$(32)
20 PMODE1,1:SCREEN1,0:PCLS3:TIMER=0:CLS
30 FORI=35 TO 210STEP 35 : R=RND(12)*15:CIRCLE(I,R),11,2,7
40 COLOR4:LINE(250,80)-(255,100),
   PSET,BF:PAINT(I,R),1,2:NEXT
50 D(0)=10:D(1)=130:I=0
60 PMODE1,1:SCREEN1,0:FORK=1TO15:NEXT
70 PMODE1,3:SCREEN1,0:PCLS3:FORJ=1 TO8+LL:
   PSET(X,Y,3)
80 GOSUB500:PMODE1,1:P=4-PPOINT(X,Y):
   PMODE1,3:PSET(X,Y,2)
90 SOUND 10+50*P,1:ON P+1 GOTO 120,100,110,50
100 NEXT:GOTO60
110 FORK=KK TO 500:NEXT:GOTO60
120 PRINT@235,"WELL DONE", "TIME TAKEN:"
   ;FIX(TIMER/50);"SECONDS"
130 PRINT:INPUT"DO YOU WANT ANOTHER GAME Y/N";Q$
140 IF Q$="N"THEN END ELSE LL=LL+1:GOTO20
500 K$=INKEY$:IFK$=""THEN530
510 IJ=INSTR(1,S$,K$):IF IJ=5 THEN JJ=0:RETURN
520 I=(SGN(IJ-2.5)+1)/2:JJ=IJ-2*I-1.5
530 IFD(I)>L THEN D(I)=D(I)+SGN(JJ)*L ELSE D(I)=L+1
540 IF D(I)<256-L THEN D(I)=D(I)+SGN(JJ)*L ELSE
   D(I)=255-L
550 X=D(0):Y=D(1)*3/4:RETURN
```

GETTING INTO LOOPS AND CIRCLES

Do you enjoy making designs with a pair of compasses? I do. But I find the point always slips and somehow the ends don't tie up as well as they should. Well your Dragon enjoys drawing circles too. There is a special command for circles which may seem a bit daunting at first because it allows you to specify so many things about the circle. However the command works as long as you specify three things (it gives the others default settings). Obviously Dragon needs to know where you want the centre of your circle to be and what the radius is. So CIRCLE(100,80),50 is the command which tells the machine to draw a circle centred at screen position 100,80 and with radius 50. To see this you need a little program:-

```
10 PCLEAR4:PMODE3:SCREEN1,1:PCLS
40 CIRCLE(100,80),50
90 GOTO 90
RUN
```

Line 10 sets up the graphics screen. Line 40 draws the circle and line 90 keeps the program showing the graphics screen. Use the BREAK key to stop the program.

A circle is a beautiful shape but lots of circles make exciting patterns. Let's see how to make them. First we'll put the circle command in a subroutine:-

```
100 CIRCLE(X,Y),R,C,HW,START,FINISH:RETURN
```

This will save a lot of typing and we have all the parameters to play with. This means that we must give them values. We'll use the default values the machine would give for C,HW,START and FINISH.

```
20 X=125:Y=100:R=50:C=4:HW=1:START=0:FINISH=1
```

We'll use loops to change the values starting with the X value. Add these lines to your program:-

```
40 FOR X=10 TO 240 STEP 5
70 GOSUB100
80 NEXT
```

Line 40 moves the centre of the circle across the screen. Line 70 calls the subroutine which draws the circle and line 80 makes the program go back through the loop until X has a value above 240.

Your whole program should now look like this:-

```
10 PCLEAR4:PMODE3:SCREEN1,1:PCLS
20 X=125:Y=100:R=50:C=4:HW=1:START=0:FINISH=1
40 FOR X=10 TO 240 STEP 5
70 GOSUB100
80 NEXT
90 GOTO90
100 CIRCLE(X,Y),R,C,HW,START,FINISH:RETURN
```

RUN this.

To make the circle drop all we need to do is to type a different line 40:-

```
40 FOR Y=10 TO 170 STEP 20
```

Now change the 20 to 2 and see what happens. Of course you can add more loops and change both X and Y together.

What about changing the radius? Type in this new line 40:-

```
40 FOR R=10 TO 170 STEP 20
```

RUN the program and then change line 40 again:-

```
40 FOR R=10 TO 170 STEP 3
```

Notice that when the circle touches the boundary of the screen it is flattened. One way to draw a boundary round a screen is to draw a circle with a large radius.

The pretty pattern above has an added pattern caused by interference patterns on the screen. We can add colour to make it more interesting. There are four colours to chose from though, of course, one is the background colour. Add line 50 to your program. It changes the value of C from 1 up to 4 and then sets it back to 1 again. So each time the machine goes through the loop the colour changes.

```
50 IF C<4 THEN C=C+1 ELSE C=1
```

RUN your program now. Of course you can't see the circle drawn in the background colour!

The next parameter is HW or HEIGHT TO WIDTH RATIO. It pulls the circle out into an ellipse (like an egg or rugby ball). If HW is less than 1 the circle is flattened: if HW is from 1 to 255 the circle is pulled up and down. Let's try it with a new line 40.

```
40 FOR HW=.01 TO 4 STEP .03
```

When you RUN this you will see a pulsating blob. It throbs because every fourth ellipse is drawn in the background colour and over-writes some of the previous ellipse. A small alteration in line 50 removes this. Just change the 1 at the end to 2. Now the background colour is not used.

The START and FINISH parameters allow us to draw incomplete circles and ellipses. the START and FINISH values go from 0 (3 o'clock) to 1 (clockwise all the way to 3 o'clock again). In fact we can go round nearly four times using values up to nearly 4. We need yet more new line 40s and we must clear the screen each time.

```
40 FOR START =0 TO 1 STEP .02:PCLS
```

Run the program now and then again with this next line.

```
40 FOR FINISH=0 TO 1 STEP .02:PCLS
```

Now if we draw just a little bit of the circle (an arc) each time and increase the radius we should see a spiral. We need line 60 which increases START from 0 to 1 and back to 0 again and again and keeps FINISH a little bit ahead of START. Of course we need to change line 40!

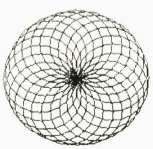
```
40 FOR R=0 TO 80
60 START=R/10:ST=ST-INT(ST):FINISH=START+.3
```

Rather pretty isn't it? Notice that START and ST are the same as far as Dragon is concerned. It uses only the first two letters to identify the variable.

Now back to those compass drawings. They look best in PMODE4 so change line 10, and change the colour in line 20 to C=1. For those of you who know some trigonometry, we need a value for π and can use arctan to obtain one. Tan(π/4) = 1 so π = 4*arctan(1). Add or overwrite these lines in your program:-

```
30 PI=4*ATN(1):R1=20
40 FOR T=0 TO 360 STEP 15
50 TH=2*PI*T/360
60 X=100+R1*SIN(TH):Y=100+R1*COS(TH)
```

I hope you like doughnuts! If you prefer dahlias alter the value of R1 in line 30 to R1=R.



DUCKS

Here is another contribution from Gareth Rowlands. You start off with 32 ducks, 96 bullets and 7500 time units. The space bar is your "trigger". If you get them all, you are given another 32 ducks, but not so many bullets and not so much time (your score continues to mount). The number of bullets is controlled by BU and BB in line 310. The time limit is controlled by T in the same line.

```
 1 REM DUCKS
 2 REM GARETH ROWLANDS, 1983
10 CLS:PCLEAR4:DEF FNA(X)=X-((X=0)*32)-1
20 GOSUB 310:SOUND 175,1:SOUND175,1
30 GOSUB 300
40 GOSUB 340
50 E=T-TIMER:PRINT@11,"TIME"E;:X=FNA(X):GOSUB 320
60 IF INKEY$><" " AND E>0 THEN50
70 BU=BU-1:IF E <1 THEN 200
80 SOUND100,1:PRINT@21,"BULLETS"BU;
90 FOR I=1311+G TO 1183+G STEP -64:X=FNA(X)
100 GOSUB320:POKEI+64,143:POKEI,103:NEXT
110 X=FNA(X):GOSUB 320:POKEI+64,143
120 IF PEEK(I)<>102 THEN POKEI,103:IF BU<0
    THEN 200 ELSE 50
130 POKEI,159:SCREEN0,1:SOUND200,1
140 I=I-1120:IF X<=I THEN Z=I-X ELSE Z=32-X+I
150 IF Z=0 THEN L$="" ELSE L$=LEFT$(D$,Z)
160 IF Z=32 THEN R$="" ELSE R$=RIGHT$(D$,31-Z)
170 DK=DK+1:D$=L$+" "+R$:SC=SC+1:
    PRINT@0,"SCORE"SC;
180 IF DK=32 THEN 250
190 IF BU>0 THEN 40
200 PRINT@0,"SCORE"SC;:
    PRINT@11,"TIME"E;:PRINT@21,"BULLETS"BU;
210 PRINT@165,"WANT ANOTHER GO?";
220 SOUND125,2:SOUND100,2:SOUND60,6
230 A$=INKEY$:IF A$=""THEN 230
240 IF A$="N" THEN CLS:END ELSE RUN
250 PLAY"V20T10L3O3CEGO4V30L1C"
260 BB=BB-10:IF BB<34 THEN BB=34
270 T=T-500:IF T<2500 THEN
    T=2500
280 SC=SC+BU:BU=BB
290 GOTO 30
300 D$=STRING$(32,38):DK=0:X=32:CLS1:
    TIMER=0:RETURN
310 SC=0:BB=96:PR=96:BU=96:T=7500:
    RETURN
320 IF X=0 THEN PRINT@PR,D$;:RETURN
330 PRINT@PR,RIGHT$(D$,X);LEFT$
    (D$,32-X);:RETURN
340 POKEG+1503,143:POKEG+1471,143:POKEG
    +1439,143:POKEG+1407,143
350 G=RND(32)
360 POKEG+1503,175:POKEG+1471,175:POKEG
    +1439,175:POKEG+1407,175
370 RETURN
```

LETTERS FROM READERS

Readers of STOP PRESS of all ages have sent in letters containing programs, tips and queries. All will be answered in the fullness of time, and we express our thanks to all writers, whether or not their contribution is included.

Two letters received concerned printers. One from D.W.Abel suggesting that a helpful article on printers would not come amiss, confirmed our feelings and has already led to the preparation of an article for the next issue. The other letter came from R.R. Computer Services, 2a Frithwood Avenue, Northwood, HA6 3LX offering listings of Dragon Programs (cost £2) on receipt of the program on cassette.

R.J.Lentle provided us with a program called INKBLOT which produces "inkblots" similar to those used in the famous Rorschad Inkblot Test. This is a device favoured by psychiatrists who ask their patients to talk about the shapes. Psychologists on the other hand are not impressed but, despite this, we think the program is of interest. Perhaps our correspondent has programmed Dragon to interpret patients comments!

```
 1 REM INKBLOT. R.J.LENTLE,GODALMING.
 10 PMODE3,1:SCREEN 1,0:PCLS
 20 DIM R(66)
 30 H=(RND(30)+36)/100
 40 CIRCLE(123,96),20,3,H
 50 PAINT(123,96),3,3
 60 GET(100,70)-(150,121),R,G
 70 PCLS:E=RND(18)+29
 80 FOR X=1 TO E
 90 B=RND(128):A=RND(192)
100 PUT(A,B)-(A+50,B+41),R,OR
110 NEXTX
120 SOUND 200,4:SOUND100,4:SOUND10,8
130 GOTO130
```

Mr T.Isaac sends his program JOY-DOODLE which uses the right joystick. On firing the button a line is drawn from the previous point to the current point. Pressing "C" re-runs the program clearing the screen. Other possibilities will suggest themselves to interested readers - using the other joystick for further information such as a centre for a PAINT command. Alternatively lines, circles and boxes could be drawn by using other pressed keys.

```
 1 REM JOY-DOODLE.T.ISAAC,WIGSTON
 10 PMODE4,1:SCREEN1,0:PCLS
 20 PSET(128,96,1)
 30 A=JOYSTK(0):B=JOYSTK(1)
 40 X=FIX(A*4.6):Y=FIX(B*3.5)
 50 PSET(X,Y,1)
 60 P=PEEK(65280)
 70 IF INKEY$="C" THEN RUN
 80 IF P=126 OR P=254 THEN 90 ELSE PRESET(X,Y):GOTO20
 90 LINE-(X,Y),PSET
100 GOTO 30
```

Mrs Pam D'Arcy is a keen QUEST player but has not managed to storm Morlock's castle yet. To continue the same adventure at a future time she offers the following procedure to dump variable values to tape:-

Load Quest and type in the following lines:-

```
  10 CLEAR432:DIMD$(9),O$(17),D(28,4),O(17,6):CLS
 1008 GOSUB10010:PRINT@PL,"WHAT NOW SIRE?";
      :A$="IUNSEWQR"
 1010 IF Q=7 THEN25000 ELSE IF Q=8
      THEN 26000: REM QUIT
      WITH SAVE OR LOAD NEW FILE RESP EC
25000 REM SAVE DATA FILE
25010 G$="SAVED"
25020 GOSUB 27000:REM GET FILE NAME
25030 OPEN"O",#-1,G$
25040 PRINT#-1,A,AL,A$,B,BC,
      BI,BM,BQ,BT,BW,BX,B$,C,CH,DF,D$
25050 FOR G=1 TO 9:PRINT#-1,D$(G):NEXT G
25060 FOR G=1 TO 28:PRINT#-1,D(G,1),D(G,2),D
      (G,3),D(G,4):NEXTG
25070 PRINT#-1,
      EG,EX,E$,F,FA,F1,HB,HC,H$,I,
      IW,J,K,L,M,MC,MF,M$,N,OC,OL
25080 FOR G=1 TO 17:PRINT#-1,O$(G),O(G,1),
      O(G,2),O(G,3),O(G,4),O(G,5),O(G,6):NEXTG
25090 PRINT#-1,P,PL,Q,QT,R$,SB,
      SF,SL,SP,ST,SU,SWF,S1,TW,V,VF,
      WT,WV,W$,X,Y,Y$,Z,ZL,ZZ
25100 CLOSE#-1:PRINT:PRINT "DATAFILE ";G$;" SAVED":END
26000 REM LOAD DATA FILE
26010 G$="LOADED."
26020 GOSUB27000
26030 OPEN"I",#-1,G$
26040 INPUT#-1,A,AL,A$,B,BC,
      BI,BM,BQ,BT,BW,BX,B$,C,CH,DF,D$
26050 FOR G=1 TO 9:INPUT #-1,D$(G):NEXTG
26060 FOR G=1 TO 28:INPUT #-1,D(G,1),D(G,2),D(G,3),D(G,4):-
      NEXTG
 26070  INPUT #- 1,EG,EX,E$,F,FA,F1,HB,HC,H$,I,IW,J
       ,K,L,M,MC,MF,M$,N,OC,OL
26080 FOR G=1 TO 17:INPUT#-1,O$(G),O(G,1),
      O(G,2),O(G,3),O(G,4),O(G,5),O(G,6):NEXTG
26090 INPUT#-1,P,PL,Q,QT,R$,SB,SF,
      SL,SP,ST,SU,SWF,S1,TW,V,VF,WT,WV,
      W$,X,Y,Y$,Z,ZL,ZZ
26100 CLOSE#-1
26110 GOSUB 9000:GOTO1008:REM
      PRINT CURRENT SCREEN & CONTINUE
27000 REM SAVE/LOAD PRINT & INPUT FILENAME
27010 CLS
27020 PRINT:PRINT"GET TAPE AND RECORDER READY FOR
      FILE TO BE "; G$,"ENTER NAME TO FILE TO BE ";G$
27030 INPUT G$
27040 RETURN
```

Mrs D'Arcy assures us that it works! We added one screen comment and although we have not given it a full test we think Quest players will find it very useful.

DRAW A DRAGON LOGO COMPETITION

The editors were delighted with the response to the first competition, with entries from boys and girls both in the U.K. and abroad. After considerable deliberation, Graham Wademan's entry was chosen as the winner of this competition. His logo was excellent and the whole program was professionally packaged. (See for yourself by typing in the listing below.).

All the logos had their own personalities. There were fat, thin, friendly and fiery dragons! One or two entries for the competition did not draw a dragon logo at all and therefore had to be excluded. Nevertheless we appreciate your programs and we print below one such entry that is skilfully constructed and represents a dragon flying! Thank you Bobby Patel for this program.

```
10 PCLS:PMODE1:SCREEN1,0
20 DRAW"BM40,50 R24 BM+10,0 R10"
30 CIRCLE(68,48),4,2:PAINT(68,48),3,2
40 DRAW"F9D11 G6R100F10D13G13L9E13U13H3L110U5E10
   U8H3L35H5BM170,113 E15U12L115U9E10
   U7L45U6G6F6U6BM+18,+5R23G10D15R114D7G16L9E13U3
   L102H6U18E5L9H4BM40,50R24F5E5"
50 PAINT(44,52),8,8:PAINT(74,54),8,8:PAINT(64,80),8,8:
   PAINT(32,60),8,8
60 DRAW"BM70,113 R9E12L9G12R9 BM+3,0E12 BM +5,0
   G12R9E13L9"
70 PAINT(82,104),8,8:PAINT(96,104),8,8
80 DRAW"BM+30,-28 E20R25E15L34G35R9L9BM-4,0 E39 R37 BM
   +5,-4 E7L52G50R8E43R42"
90 PAINT(180,44),8,8:PAINT(180,25),8,8
100 DRAW"BM20,10C2R214D115L214U115 BM-3,-3 C3
    R221D121L221U121":PAINT(16,180),2,3
110 DRAW" BM40,150 C3 D3 BM+5,0 D12R2E4U4H4L2BM+
    10,0 D12U5R3F5H5E3U1H3L2 BM+10,+12
    U6R2U6R5D6L5R6D6 BM+4,0
    R7U4L3R3D4L7U12R6D2BM+4,0
    U2D12R8U12L8R8BM+4,0D12U12F12U12BM+
    55,0 D12R8BM+4,0U12R8D12L8R8 BM+4,0"
120 DRAW"R6U4L3R3D4L6U12R6D2U2BM+4,0
    D12R8U12L8R8BM+3,0U3"
130 DRAW"BM+6,-5C4L183D26R183U26"
140 DRAW"BM+5,-5 C1 L192D35R192U35"
150 GOTO150
```

```
10 CLS:CLEAR1000
20 A$="":SP$=STRING$(27,32)
30 FORN=1TO4:FORJ=1TO5:READCR
40 A$=A$+CHR$(CR):NEXTJ
50 A$=A$+SP$:NEXTN
60 FORN=1TO3:B$=B$+STRING$(5,143)
   +STRING$(27,32):NEXT:B$=B$+STRING$(5,143)
```

```
70 FORX=12TO332STEP1
80 PRINT@X,A$:FORJ=1TO20:NEXT:PRINT@X,B$
90 NEXT
100 END
110 DATA 143,143,128,128,129
120 DATA 143,143,128,141,143
130 DATA 132,143,128,128,143
140 DATA 128,128,128,128,143
```

SOLUTION TO DRAGON PUZZLE 2

The numerical solutions to the clues gave the appropriate line numbers for the program statements to play the tune 'Oh when the saints go marching in'. The solutions were in order 1914,20,1492, 13, 1981,1918,1066,18.

WIN 4 SOFTWARE CASSETTES (COMPETITION)

Four ants start from the four corners of the **PMODE4** screen and travel in such a way that each ant always travels towards the nearest ant in the clockwise direction. All movement is at the same uniform speed. Write a program to demonstrate the nature of the paths taken by the ants.

The competition is open to all ages and the best solutions in each age group will receive the choice of free Dragon software. Send your entries to the editorial address on a cassette together with your name and address and age (if under 16) not later than September 30th.

DRAGON the teacher

Educational software is now the 'in' thing with the boom in home computers. Commercial educational software is usually sophisticated and consequently time-consuming to write. Nevertheless small programs designed to do a particular task can be fun to write with the advantage that they may be tailor made to your own specific needs.

Take your daughter or son at secondary school who has a language vocabulary to learn each week. The program following is simple and to the point, allowing the user to input a vocabulary in two languages and then answer randomly chosen questions.

```
 1 REM LANGUAGE TESTER A.M.SYKES
10 INPUT"HOW MANY WORDS";N:DIM A$(2,50)
20 INPUT"FIRST LANGUAGE";B$(1):INPUT"SECOND
   LANGUAGE";B$(2)
30 CLS:FOR I=1 TO N:FOR J=1 TO 2:PRINT"ENTER WORD";
   I;"IN ";B$(J):INPUT A$(J,I):NEXTJ,I
40 I=RND(N):J=RND(2):IF J=2 THEN K=1 ELSE K=2
50 CLS:PRINT"WHAT IS THE ";B$(J);" WORD FOR ",A$(K,I)
60 INPUT AN$:IF AN$=A$(J,I) THEN PRINT
   "WELL DONE":GOSUB70:GOTO40: ELSE PRINT
   "NO---TRY AGAIN":GOSUB70:GOTO50
70 FOR D=1 TO 400:NEXT:RETURN
```

Or consider building up a vocabulary of English words and their opposites. This can be done with DATA statements so that information can be recorded on tape and extended as and when required.

To have this facility, the program is constructed using a succession of X's at the end of the DATA statements. This serves not only to provide a stop to the READing of the data, but also to leave space on the tape recording for subsequent recordings of an extended version.

```
 1 REM OPPOSITES A.M.SYKES
10 C=1:DIM A$(2,50)
20 FOR I=1 TO 2:READA$(I,C):IF LEFT$(A$(I,C),3)="XXX"
   THEN 30 ELSE NEXT I:C=C+1:GOTO20
30 I=RND(C):J=RND(2):IF I=II THEN 30 ELSE II=I
40 IF J=2 THEN K=1 ELSE K=2
50 CLS:PRINT"WHAT IS THE OPPOSITE OF ";A$(J,I)
60 INPUT AN$:IF AN$=A$(K,I) THEN PRINT "WELL
   DONE":GOSUB70:GOTO30:ELSE PRINT "TRY
   AGAIN":GOSUB70:GOTO50
70 FOR D=1 TO 400:NEXT:RETURN
80 DATA ASLEEP,AWAKE,ADD,SUBTRACT,
   LIVELY,DULL,SOBER,DRUNK,FALL,RISE,LARGE,SMALL,
   FAST,SLOW,UGLY,BEAUTIFUL,NEAR,FAR,HIGH,
   LOW,SILLY,SENSIBLE,LIGHT,DARK,XXXXXXXX
```

These two programs are useful but rather plain. They also suffer (as far as young children are concerned) in demanding a typed response. The last program overcomes this problem by presenting a numbered list. With the addition of movement and sound it also becomes more interesting to the user. Try it and see if you can correctly identify the second member of each pair. (Apologies to Dragon owners in Huddersfield for the repetition!)

```
 1 REM PAIRS A.M.SYKES
10 DIMA(15),A$(2,15),F(15):FOR I=1 TO 15:A(I)=I:NEXT
20 FOR I =15 TO1STEP-1:C=RND(I):W=A(C):
   READA$(1,I),A$(2,I):A(C)=A(I):A(I)=W:NEXTI
30 FOR I=1TO15:PRINT@32*I-32,A$(1,I)+" AND...":NEXTI
40 GOSUB80:FOR I=1TO 15
50 PRINT@32*I-19, "";:INPUTN:IF A(N)<>I
   THEN SOUND10,8:GOSUB80:GOTO50
60 F(N)=1:GOSUB80:GOSUB100:NEXTI
70 PLAY"L6BL3O4C":STOP
80 FOR J=1TO15:IFF(J)=1THEN NEXTJ ELSEPRINT@32*J-
   11,J;A$(2,A(J)):NEXTJ
90 RETURN
100 PLAY"T5O4CO3L10GF#GL4G#G":FOR K=1TO9:PRINT@32*
   N-9-K,A$(2,I)+STRING$(K+2,32);:NEXTK
110 IF N>I THEN ST=-1 ELSE ST=1
120 FOR K=N TO I STEP ST:PRINT@32*K-19,A$(2,I);:FOR L=1
   TO 50:NEXTL:PRINT@32*K-19,STRING$(7,32);:
   NEXTK:PRINT@32*I-19,A$(2,I);:FOR M=1TO I:
   PRINT@32*M-19,A$(2,M);:
   NEXTM:RETURN
130 DATA BOOTS,SHOES,SOAP,WATER,KNIFE,FORK,
   NEEDLE,THREAD,BISCUITS,TEA,BACON,EGG,FISH,
   CHIPS,LAND,SEA,CLOAK,DAGGER,HARD,FAST,
   CUP,SAUCER,BLACK,WHITE,LITTLE,LARGE,
   PEEK,POKE,KING,QUEEN,SALT,PEPPER
```

More new titles . . .

Watch out for the following new titles in the official Dragon software list. They will be appearing in your shops soon.

Viking
Monsters and Magic
Words, Words, Words
Lets Count

Bloc Head
Nerble Force
Adventure Trilogy
Beyond the Cimeeon Moon

Forth
Bridge
Moon Hopper
Jumpjet

Lunar Rover Patrol
Cosmic Clones
El Bandito
Star Fighter
Super Dragon Writer 11

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